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(56) Documents Cited

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(54) Abstract Title

A self watering tiered plant container

(57) A self watering plant container 110 comprising an open compartment 112 to contain plants and a closed compartment 114 including a water reservoir 126. The enclosed compartment includes a filling means 116 and a discharge means 118, the discharge means including a weir 122 to regulate liquid flow from the reservoir 126 through the discharge means. Stacking the container above similar containers 210 310 allow excess fluid to drain into the containers below thus creating a tiered watering effect.

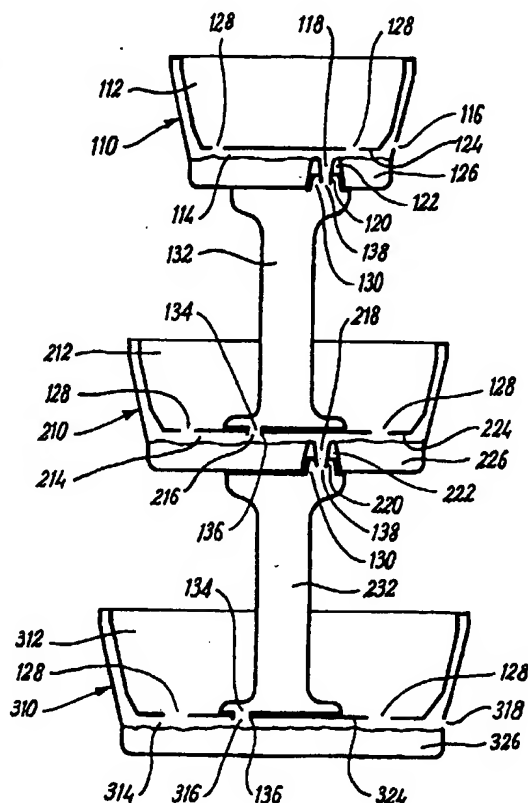


FIG. 3

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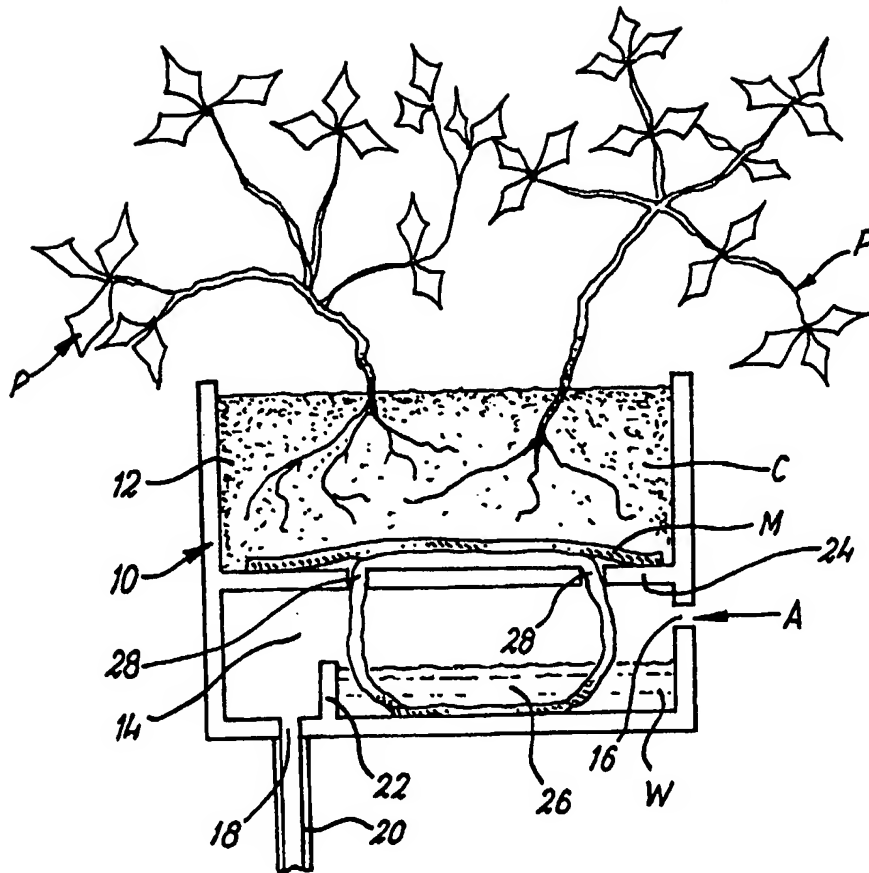


FIG. 1

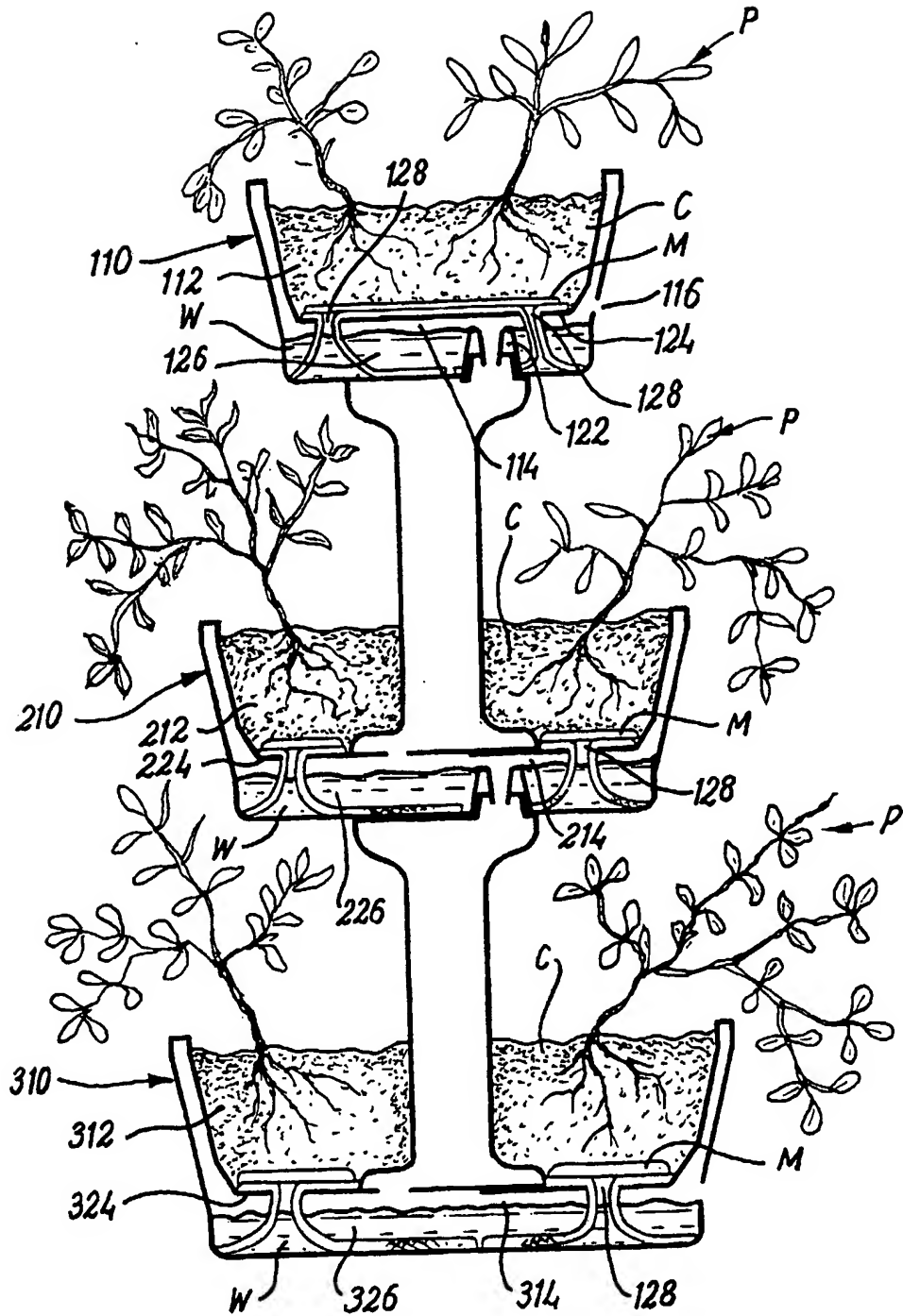


FIG. 2

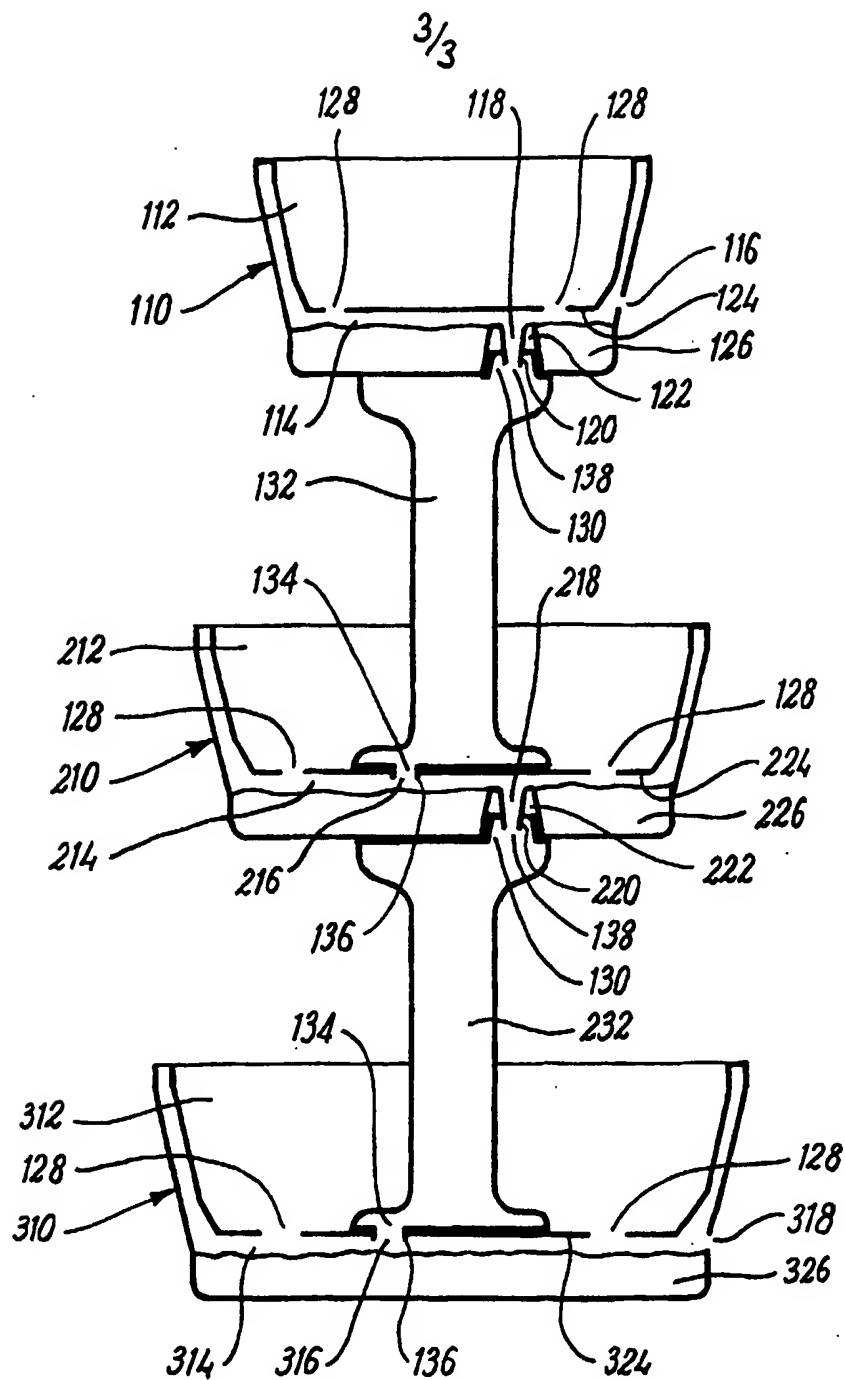


FIG. 3

10 21 51

Plant Container

The present invention concerns improvements in or relating to plant containers.

The idea of "self-watering" plant containers is well known. Such containers generally comprise an open compartment in which plants may be planted in soil or compost and a substantially enclosed compartment separate to the open compartment containing compost, which contains water. A filling aperture is provided to allow replenishment of the water at regular intervals. Capillary matting extends between the compost in the open compartment into the water in the enclosed compartment, allowing take up of water into the compost. The substantially enclosed compartment minimises the evaporation loss of water, reducing the frequency of watering required and with the capillary matting laid as a mat underneath the compost, the water is available to the roots of the plants. The filling aperture is often located on the side of the plant container, allowing easy access without risk of damaging foliage or flowers, and the use of the capillary matting ensures that there is a reduced risk of over-watering, since water is supplied "on demand", and the growing conditions for plants are improved since water supply is continuous and even, rather than a soaking followed by a drying as with conventional containers.

According to one aspect of the present invention, there is provided a plant container comprising a substantially enclosed compartment, the enclosed compartment comprising a filling means, a reservoir for liquid storage and a discharge means, the discharge means including a means for regulating liquid flow from the reservoir.

Preferably the plant container comprises a first compartment being said enclosed compartment, and a second compartment for containing plants and compost, and preferably a dividing wall separates the first compartment from the second compartment. The second compartment may be an open compartment. Preferably an aperture is provided in the dividing wall between

the open compartment and the enclosed compartment, and capillary matting may extend from the open compartment, through the aperture and into the liquid stored in the reservoir in the enclosed compartment.

Preferably the regulating means regulates the maximum level of the liquid in the reservoir.

The regulating means may comprise a weir. Preferably the discharge means includes a discharge aperture. Preferably the weir separates the reservoir from the discharge aperture.

Preferably the filling means is located above the reservoir and on the side of the weir away from the discharge aperture. Preferably the filling means comprises an aperture.

Preferably the filling aperture is located in a side wall of the enclosed compartment.

According to the present invention there is further provided a plant container assembly comprising a first container substantially as described above, a second container, and liquid conducting means to conduct liquid from the first to the second container, the second container comprising a substantially enclosed compartment, the enclosed compartment comprising a filling means and a reservoir for liquid storage, the liquid conducting means of conducting liquid from the discharge means of the first container to the filling means of the second container.

Preferably the second container includes a discharge means to discharge liquid from the reservoir thereby regulating the amount of liquid in the reservoir. Preferably the discharge means comprises an aperture defined in a side wall of the enclosed compartment, at or just above the maximum desired level of the liquid in the reservoir.

Preferably the second container includes a first compartment being said enclosed compartment and a second compartment for containing plants and compost.

Preferably the assembly includes a support member. Preferably the first container is engageably mounted on the support member. Preferably the support member is engageably mounted on the second container. Preferably the liquid conducting means is substantially within the support member. Preferably the liquid conducting means is substantially formed as part of the support member.

Preferably the assembly comprises a third container, arranged between the first container and the second container. Preferably the third container includes the features of the first container as described above in paragraphs 3 to 8. Preferably the liquid conducting means conducts liquid from the discharge means of the first container to the filling means of the third container and from the discharge means of the third container to the filling means of second container.

Preferably the support member is engageably mounted on the third container, which is engageably mounted on a second support member, which is engageably mounted on the second container. The second support member may be the same as the first mentioned support member.

Preferably the liquid conducting means is substantially within the respective support members, and may be formed as part of the support members.

An embodiment of the present invention will now be described by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 shows a sectional view of a container;

Fig. 2 shows a sectional view of a plant container assembly comprising three containers filled with compost and plants; and

Fig. 3 shows a similar view to Fig. 2 in which the plants and compost have been removed for clarity.

Referring to Fig. 1, a container 10 comprises an upper, open compartment 12 and a lower enclosed compartment 14 separated by a dividing wall 24. The upper open compartment 12 is shown in Fig. 1 containing compost C and planted with plants P. The lower enclosed compartment 14 comprises a reservoir 26 and a discharge outlet 18, the discharge outlet 18 being separated from the reservoir 26 by a weir 22. The discharge outlet 18 is connected to a discharge tube 20. A filling aperture 16 is located in an outer wall of the lower enclosed compartment 14 above the reservoir 26.

The dividing wall 24 between the upper and lower compartments includes a number of openings 28. Capillary matting M laid on the dividing wall 24 and underneath the compost C protrudes through the openings 28 and into the water W contained in the reservoir 26. As the compost C loses moisture by evaporation and to the plant, water is drawn up from the reservoir 26 into the upper open compartment 12 by the capillary matting M.

In use, water is added to the reservoir 26 through the filling aperture 16, as indicated by arrow A. Water fills the reservoir 26 and eventually overflows the weir 22 and discharges through the discharge outlet 18 into outlet tube 20.

Figs. 2 and 3 show an assembly of similar such containers which have been mounted on top of each other. Referring to Fig. 3 for clarity, the features of the upper container 110 are similar to the container 10 described above, and the majority of these features are also similar to those of the middle container 210 and the lower container 310. As before, the containers 110,210,310 have open compartments 112,212,312 (which contain compost C and plants P as shown in Fig. 2) and enclosed compartments 114,214,314 which in the

containers as illustrated in Fig. 3, are formed in the hollow walls and bases of the containers. The enclosed compartments 114,214,314 comprise reservoirs 126,226,326 respectively, which hold water. The dividing walls 124,224,324 between the two compartments include a number of openings 128, and it can be seen in Fig. 2 that, as before, capillary matting M can extend from the open compartments 112,212,312 containing the compost C and plants P through the openings 128 to the reservoirs 126,226,326 in the enclosed compartments 114,214,314.

In the upper and middle containers 110 and 210, the lower enclosed compartments 114,214 include discharge outlets 118,218 respectively, separated from the reservoirs 126,226 by weirs 122,222 respectively. In Figs. 2 and 3 each of the weirs 122,222, form, in plan, an annulus around the respective discharge outlet 118,218. The discharge outlets 118,218 are connected to discharge tubes 120,220 respectively.

The upper container 110 is mounted on a vertical support member 132, and vertical support member 132 is mounted on the middle container 210. Middle container 210 is mounted on another vertical support member 232, which is mounted on the lower container 310.

Each of the vertical members 132,232 includes an inlet formation 130 and an outlet aperture 134. The inlet formation 130 engages with a complementary formation on the underside of the container situated above, the complementary formation located on the underside of the annular weir 122, 222. The inlet formation 130 includes an inlet aperture 138 which engages with an end of the discharge tube 120, 220.

The upper container 110 includes a filling aperture 116 located in an outer wall of the lower enclosed compartment 114 above the reservoir 126. The middle and lower containers 210,310 each include a filling aperture 216,316 respectively, located in the respective dividing walls 224,324. A downwardly directed lip 136 around the periphery of the outlet aperture 134 engages with

the filling apertures 216,316, the outlet aperture 134 communicates with the filling apertures 216,316. It will be noticed that the position of the filling aperture 216 is horizontally offset from the discharge outlet 218 of the middle container, so that water does not flow directly into the discharge outlet without first filling the reservoir.

The lower container 310 includes a discharge outlet 318 located on an outer side wall, at or just above the highest desired level of the water in the reservoir 326.

In use, water is added at the filling aperture 116 in the upper container 110. The water fills the reservoir 126 and eventually overflows the weir 122 and falls through the discharge aperture 118 and the discharge tube 120 into the vertical member 132. The water discharges via the outlet aperture 134 into the reservoir 226 of the middle container 210. As the filling operation proceeds, this reservoir in turn fills and the water overflows the weir 222, falling via the vertical member 232 into the reservoir 326 of the lower container 310. This reservoir fills until the water level reaches the level of the discharge outlet 318, at which point water flows out of the container and down the outside of the container. The operator controlling the flow of the filling water knows that at this point all of the reservoirs in the assembly are full and that the water flow can be turned off. Thus in one simple operation three plant containers have been replenished with water and the operator has confidence that the reservoirs in the containers are full.

Various modifications may be made without departing from the scope of the invention. For example, the shape of the containers and supports may be varied for aesthetic or practical reasons. Engagement means such as nibs and recesses, or bolts and threaded inserts, or some other means may be provided on the containers and the vertical members to locate and secure the vertical members and the containers together.

The upper container may be the only container to have a filling aperture,

or filling apertures may be provided in some or all of the containers. There may be one filling aperture in a container or several, allowing filling from different directions.

The number of containers in the assembly may vary. The assembly may comprise two, three or more containers.

An alternative means for regulating the water flow from one container to another may be used. The weir may take a different form from that described in the embodiments.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

CLAIMS

1. A plant container comprising a substantially enclosed compartment, the enclosed compartment comprising a filling means, a reservoir for liquid storage and a discharge means, the discharge means including a means for regulating liquid flow from the reservoir.
2. A plant container according to claim 1, in which the plant container comprises a first compartment being said enclosed compartment, and a second compartment for containing plants and compost.
3. A plant container according to claim 2, in which the second compartment is an open compartment.
4. A plant container according to claim 2 or claim 3, in which a dividing wall separates the first compartment from the second compartment, and an aperture is provided in the dividing wall.
5. A plant container according to claim 4, in which capillary matting extends from the open compartment, through the aperture and into the liquid stored in the reservoir in the enclosed compartment.
6. A plant container according to any of the preceding claims, in which the regulating means regulates the maximum level of the liquid in the reservoir.
7. A plant container according to claim 6, in which the regulating means comprises a weir.
8. A plant container according to claim 7 in which the discharge means includes a discharge aperture and the weir separates the reservoir from the discharge aperture.
9. A plant container according to claim 8, in which the filling means is located above the reservoir and on the side of the weir away from the discharge

aperture.

10. A plant container according to any of the preceding claims, in which the filling means comprises an aperture.
11. A plant container according to any of the preceding claims, in which the filling aperture is located in a side wall of the enclosed compartment.
12. A plant container assembly comprising a first plant container according to any of the preceding claims, a second container, and second liquid conducting means to conduct liquid from the first to the second container, the second container comprising a substantially enclosed compartment, the enclosed compartment comprising a filling means and a reservoir for liquid storage, the second liquid conducting means conducting liquid from the discharge means of the first container to the filling means of the second container.
13. A plant container assembly according to claim 12, in which the second container includes a discharge means to discharge liquid from the reservoir thereby regulating the amount of liquid in the reservoir.
14. A plant container assembly according to claim 13, in which the discharge means of the second container comprises an aperture defined in a side wall of the enclosed compartment, at or just above the maximum desired level of the liquid in the reservoir.
15. A plant container assembly according to any of claims 12 to 14, in which the second container includes a first compartment being said enclosed compartment and a second compartment for containing plants and compost.
16. A plant container assembly according to any of claims 12 to 15, in which the assembly includes a support member.
17. A plant container assembly according to claim 16, in which the first

container is engageably mounted on the support member.

18. A plant container assembly according to claim 16 or claim 17, in which the support member is engageably mounted on the second container.

19. A plant container assembly according to any of claims 16 to 18, in which the second liquid conducting means is substantially within the support member.

20. A plant container assembly according to any of claims 16 to 19, in which the liquid conducting means is substantially formed as part of the support member.

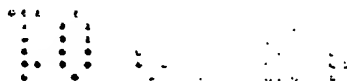
21. A plant container assembly according to any of claims 12 to 15, in which the assembly comprises a third container, arranged between the first container and the second container.

22. A plant container assembly according to claim 21, in which the third container includes the features of the first container according to any of claims 1 to 13.

23. A plant container assembly according to claim 22, in which the second liquid conducting means conducts liquid from the discharge means of the first container to the filling means of the third container and from the discharge means of the third container to the filling means of second container.

24. A plant container assembly according to any of claims 21 to 23, in which the first container is engageably mounted on a first support member which is engageably mounted on the third container, the third container being engageably mounted on a second support member, which is engageably mounted on the second container.

25. A plant container assembly according to claim 24, in which the second support member is the same as the first support member.



26. A plant container assembly according to claim 24 or claim 25, in which the second liquid conducting means is substantially within the respective support members.
27. A plant container assembly according to any of claims 24 to 26, in which the liquid conducting means is formed as part of the support members.
28. A plant container substantially as hereinbefore described and with reference to Fig. 1.
29. A plant container assembly substantially as hereinbefore described and with reference to Figs. 2 and 3.
30. Any novel subject matter or combination including novel subject matter disclosed herein, whether or not within the scope of or relating to the same invention as any of the preceding claims.



INVESTOR IN PEOPLE

Application No: GB 0030599.5
Claims searched: 1 to 29

Examiner: Nicola Keeley
Date of search: 21 March 2002

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): A1E (EAE EAKA EAKX)

Int Cl (Ed.7): A01G (9/02, 27/02, 27/06)

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X, E	GB 2353932 (RIDGE) See especially figures	1-5, 10
X	GB 2107962 (SCRIVENS) See especially figure 3	1-5, 10, 11
X	GB 2095083 (NGAU) See especially figures	1-6, 10, 11
Y	EP 0623276 A2 (NEVO) See especially figure 1	1-5, 10, 12, 13, 14-18, 21-25
X	EP 0012011 A1 (HOPE) See especially figures and page 1 lines 1 to 15 and page 3 line 9 to page 4 line 7	1-5, 10-18, 21-25
Y	US 5826375 (BLACK) See especially figures	1-5, 10, 12, 13, 14-18, 21-25
Y	US 3841023 (CARLYON) See especially figures	1-5, 10, 12, 13, 14-18, 21-25
X, Y	FR 2717346 A1 (YVAN) See especially figures	X = 1-5, 10 Y = 12, 13, 14-18, 21-25

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



INVESTOR IN PEOPLE

Application No: GB 0030599.5
Claims searched: 1 to 29

13

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Date of search: 21 March 2002

Category	Identity of document and relevant passage	Relevant to claims

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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